Enhancing vegetable value chains in rice-based and sole crop production systems to improve farm household income and consumer access to safer vegetables in Morogoro, Tanzania

World Vegetable Center

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The Africa Research In Sustainable Intensification for the Next Generation (Africa RISING) program comprises three research-for-development projects supported by the United States Agency for International Development as part of the U.S. government's Feed the Future initiative.

Through action research and development partnerships, Africa RISING will create opportunities for smallholder farm households to move out of hunger and poverty through sustainably intensified farming systems that improve food, nutrition, and income security, particularly for women and children, and conserve or enhance the natural resource base.

The three projects are led by the International Institute of Tropical Agriculture (in West Africa and East and Southern Africa) and the International Livestock Research Institute (in the Ethiopian Highlands). The International Food Policy Research Institute leads an associated project on monitoring, evaluation and impact assessment.

Purpose, objectives, planned outputs

This first phase of the project was expected to lay the foundation to achieve the long-term objective by identifying specific major production and market constraints of rice-vegetable production systems, characterization of production sites and consumption patterns, implementation of pilot studies on food safety analysis to increase consumer awareness of safer vegetable. Planned outputs for this phase were:

1. Baseline data on production and market constraints of vegetables as intercrop with rice or as sole cropping system and food safety analysis with vegetable supply chain actors. A baseline study conducted using participatory appraisal approaches through surveys and complemented by stakeholder consultations. Results would be used to understand knowledge, perceptions and practices of farmers and market vendors regarding food production, marketing and safety constraints.

2. Characterization of rice-vegetable based production sites and consumption patterns of representative rural and urban households in the target region. Major rice-vegetable based production sites and consumption patterns mapped and characterized to estimate the relative prevalence and performance of existing mixed crop production systems.

3. On farm assessment of the incidence of pests and diseases for tomato and African eggplant. Evaluation of the incidence of pests and diseases through visual assessment supported by laboratory analysis using cultural, ELISA and other diagnostic tests with particular focus on common and damaging diseases.

4. Analysis of microbial, pesticide and heavy metal contamination of market and farm samples of tomato and African eggplant. Fifty samples each of tomato and African eggplant collected from farmers' fields and the selected markets (plus samples of wash water) for laboratory analysis of pesticides and heavy metals at TPRI according to standardized protocols (250 samples in total). Fruits evaluated visually for quality, packaged, kept cool in transport and tested for human pathogens using methods developed by Ohio State University at Sokoine University of Agriculture. Methods to reduce contamination at markets identified and disseminated.

5. Stakeholder workshops to develop strategic partnerships, evaluate results through participatory learning, action research and outcome mapping tools to refine intervention strategies. An inception workshop will actively engage participation of representatives of all identified stakeholders in the production and marketing chain vegetable production systems as well as research and development actors to build new partnerships. A summary workshop will discuss the results of the value chain baseline study, levels of biological and chemical contaminants and develop and disseminate intervention strategies.

Partners

Activity	AVRDC	IITA	SUA	OSU	Hort-CRSP+	Africa-Rice	SRI	TPRI	DALDOs
1. Project coordination	L*								
2. Inception workshop	L*	*	*	*	*	*	*	*	*
3. Baseline socio-economic study	L*		*			*			
4. Characterization of production and consumption patterns	L*	*	*		*	*			*
5. On-farm assessment of pest and	*	L*	*				*		
6. Analysis of microbial, pesticide and heavy	*	L*	*	*				*	
7. Awareness campaign	L*	*	*		*	*	*	*	*
8. Reflection and learning workshop	L*	*	*	*	*	*	*	*	*

* L indicates lead institution for activity; + HortCRSP involvement is through SUA staff

Achievements against plan

Partnerships between personnel of partner institutions were strengthened following signing of all four envisaged sub-agreements in the second quarter of the project and joint conduct of activities. A quantitative baseline study of 237 producers and 28 qualitative value actor surveys was conducted using stratified random sampling and participatory appraisal approaches complemented by stakeholder consultations. Farm inspections and surveys on food safety, pest and disease as well as pesticide abuse awareness was created among farmers during the sample collection. The costs and returns analysis of seed and agrochemical inputs indicated higher farm enterprise budgets for pesticide use, particularly for tomato. Results were used to understand the knowledge, perceptions and practices of farmers and market vendors regarding food production, safety and associated plant health and marketing constraints. Perceptions of value chain actors on how to address the noted constraints were also elicited and summarized along with the results of the surveys during the planned learning and reflection workshop held from September 20-21, 2012. The workshop was well attended by partners and collaborators. Due to time constraints proposed interventions that were envisaged to be assessed through technology dissemination systems and gender issues related to production and marketing are being planned for a possible phase II of the project.

Key deliverable deviation

The delays in the signing of the main agreement with AVRDC and subsequent sub-agreements and disbursement of funds significantly affected implementation of all five project activities. Two communities initially selected for the producer baseline socioeconomic survey had to be replaced due road accessibility and time constraints during the survey. Late implementation of the socioeconomic surveys (Activities 1 and 2) in turn delayed the data entry, cleaning and analysis process. Collection of on-farm and market samples for analysis of microbial, pesticide and heavy metal analysis (Activities 3 and 4) was most severely affected as activities did not commence until in the second half of August, 2012. This development in turn made it virtually impossible to harmonize and finalize results during the reflection and learning workshop held in late September, 2012, for the awareness creation and dissemination aspect of Output 5.

Geo-tagged locations/sites where activities took place

- Quantitative socioeconomic and consumption surveys of 237 producers in the Mvomero and Kilombero districts, Morogoro from 20 June-5 July, 2012.
- Data entry, cleaning and preliminary analysis of baseline socioeconomic data, AVRDC-Arusha, 12 July-30 September, 2012
- Collection of 50 farm samples from the Mlali division of the Mvomero district (i.e., Mlali, Kipera, Msongozi, Maharaka and Doma villages) and 141 market samples [Mamibo (29), Kigamboni (25) Temeke (29), Mvomero (58)] of tomato and African egg plant from 15 August-7 September, 12012 by IITA, SRI, SUA and for detection of microbial, pesticide and heavy metal detection at TPRI.
- Shipment of on-farm and market samples to from SUA and IITA to TPRI for analysis 7 September, 2012.
- Qualitative survey of 28 vegetable value actor surveys (i.e., seed and agro-dealers, collectors, wholesalers, retailers, traders and consumers in Morogoro municipal, Mvomero and Mlali wards of Morogoro region by AVRDC and SUA from 26-30 August, 2012.
- Reflection and learning/closing workshop involving all partners and collaborators: Nashera Hotel, Morogoro, Tanzania.

Support of AFRICA RISING

The activities in this first phase of the project makes a direct contribution to sustainable intensification of mutually beneficial rice-vegetable based cropping systems through a participatory problem analysis and intervention strategy development process involving several stakeholders and research and development actors. The baseline surveys conducted jointly by partners will support impact analysis of subsequent phases by providing baseline data through participatory identification and mapping of opportunities for sustainable intensification of horticultural value chains in association with rice. Linkages between the socioeconomic and plant pathology research teams, whereby the former alerted the latter of identified hotspots of diseases of focus crops for detailed pest and diseases analysis follow up and produce sampling for laboratory analysis also ensured that sampling at action sites and results could be harmonized and is consistent with Africa RISING's objective of partnership development. The project thus involved action research to build partnerships required to increase consumer access to safe vegetables through short term outputs that will contribute to the long term objectives of Africa RISING.

Scalability

We intend to create increased awareness for intensifying rice-vegetable production systems, particularly the use of residual water (following rice harvest) for vegetable production and food safety awareness based on results from our farm and market sample analysis of microbial, pesticide and heavy metal detection. We have also identified entry points for improving the vegetable value chain, through improved technological innovations (e.g. introducing improved vegetable germplasm/quality seeds), strengthening of market information systems and farmer groups through targeted

capacity building programs to enhance direct market access. Preliminary analysis from our small sample sizes in this phase of the project indicates alarming concerns on food safety. However, further validation is required with larger sample sizes and geographical scope, in order to develop a plan of action on the awareness creation and intervention packages on best management solutions to pest and disease incidences identified in the target and affected farmers in the project area.

Lessons learned

Delays in signing of partner sub-agreements and resulting transfer of funds slowed down implementation of certain activities. Building partnerships and the needed trust requires some considerable amount of time to achieve the required results. Overall, it has been a good start bringing different partners on board and this would help the Africa RISING project focuses on bigger picture issues during a second and expected longer-term phase than it would have been without this initial phase. Due to time and logistic constraints, our initial plan of harmonization of all socioeconomic surveys (Output 1 and 2) with on-farm survey of disease and pest incidence for food safety analysis (Output 3) via a single survey instrument was practically quite challenging as we ended up having a very longer questionnaire and separate surveys. Notwithstanding, the socioeconomic team provided information on disease hotspots that allowed the plant pathology group to do necessary follow ups in some cases. Lack of some specialized equipments for food safety analysis at SUA was also a major constraint as the project could not invest in these mostly expensive equipments within the life cycle of this first phase.

Publicity

Analysis from the baseline surveys on production, marketing and consumption of rice-vegetable systems as well as plant pathology and the analysis of food safety are planned for presentation at conferences and publishing in peer reviewed journals, particularly, the study on characterization of integrated production systems. Ex-post impact assessment of detailed interventions to be introduced in a subsequent phase of the project will be conducted and published in peer-reviewed journals as well. Policy briefs could also be developed and disseminated to policy makers and the donor community.

Documentation of success

No particular success story had been documented at the time of reporting. Opportunities however exist for increased direct market access for beneficiary tomato farmers in organized groups to follow the recent establishment of processing industries in the project sites